-----Original Message-----
From: Daniel Hirsch [mailto:dohirsch@ucsc.edu]
Sent: Monday, April 18, 2016 12:04 PM
To: LEE, LILY <LEE.LILY@EPA.GOV>
Cc: Walker, Stuart <Walker.Stuart@epa.gov>
Subject: Hunters Point info request

Hi Lily,

The Hunters Point documents we have been reviewing indicate a remediation level for radium-226 of 1 pCi/g above background, not to exceed 2 pCi/g, "per agreement with EPA." Could you send me documentation of that EPA agreement and its basis, and any risk assessment that was performed at the time of the risk associated with that level of radium? Also, I am having trouble locating the value being employed for radium background—could you let me know what value is being used and where I can find the source for it?

Additionally, I have not been able to locate anything in the links you sent me for the 5-Year reviews regarding EPA review of those reviews as to compliance with EPA CERCLA guidance for radionuclides, including consideration of changes to EPA PRGs. Could you direct me to such review if it took place?

Lastly, during our call last week Derek Robinson from the Navy offered to provide additional information on request. On the 13th I emailed him regarding questions and documents about the Tetra Tech matter. I haven't heard back. Given the upcoming meeting on Thursday, I very much would like to have that information now. If there is anything you can do to help facilitate getting a response from the Navy, I would appreciate it.

Thank you for your help.

Daniel Hirsch
Director
Program on Environmental and Nuclear Policy College Ten University of California at Santa Cruz

Draft Response:

Regarding "documentation of that EPA agreement and its basis, and any risk assessment that was performed at the time of the risk associated with that level of radium," I have requested documents from our Superfund Records Center regarding documentation of the remediation level of Radon 226. I have not received them yet, but I will send them to you when they arrive. In the mean time, we have used the current EPA PRG Calculator to verify that the risk level associated with 1 pCi/g is within the EPA risk range.

Regarding background levels, they vary depending on what part of the site work is done. They are determined based on samples collected at reference areas. These are documented in the Radiological Removal Action Completion Reports (Rad RACRs) and the Survey Unit Project Report Abstracts (SUPRAs) for different sections of the site. You can find these documents on EnvirStor. For example, here's the link to the 27 MB 1st section of the Parcel UC-3 Rad RACR:

2005 Basewide Radiological Workplan:

8.1 REFERENCE (BACKGROUND) AREAS

An average background level will be determined by performing measurements at systematic or random locations within the designated background area. The detector probe will be held approximately 10 cm (4 inches) from the surface area for gamma and 0.25 inch from the surface area for alpha/beta radiation. Instrumentation will be allowed to stabilize before background readings are taken. The average of all of the readings taken will determine the background. Background scan ranges, smears, and exposure rates will also be collected for reference data. In some cases, solid samples will need to be collected in the background area for comparative analyses of specific survey units. The same survey methodology and instruments used to collect the background data will be used to perform measurements within survey units.

Data collected in reference areas will be statistically evaluated using a graphical format, such as a frequency distribution chart. The purpose of the evaluation is to ensure that the data collected in the reference area is consistent with a normal distribution and that the variability of the background is not too high. Background variability may be considered high when differences in estimated mean concentration measured in potential reference areas are comparable to screening level DCGLs. NUREG-1505 (NRC, 1997b), Chapter 13, *Demonstrating Indistinguishability from Background*, provides detailed guidance for evaluating reference areas exhibiting high variability.

http://www.envirostor.dtsc.ca.gov/regulators/deliverable_documents/3814468204/Hunters%20Point_Final%20Radiological%20Removal%20Action%20Completion%20Report%201of3_03.16.2012.pdf

Here is an excerpt from this report that discusses the background for Radon-226 for **Parcel UC-3, p. 3-7 of its Rad RACR:**

3.3 REFERENCE AREA

Reference area samples for the sanitary sewer and storm drain removal project were obtained in April 2006 in an area of the Building 813 parking lot in Parcel D-2. Building 813 was identified in the HRA as being impacted, but the parking lot area was not identified as being impacted, and is considered of like material to that encountered in the soils in survey units. Eighteen samples were collected systematically from this area for reference area purposes. All 18 samples were analyzed at the on-site laboratory by gamma spectroscopy. Ten percent of samples (two samples total) were also analyzed for ^{90}Sr at the on-site laboratory. The reference area samples provided a basis for net activity concentration. Background activity for ^{226}Ra was determined to be 0.485 pCi/g, placing the release criterion at 1.485 pCi/g of ^{226}Ra.

For Parcel G:

The investigation level for gamma radiation surveys was established at the reference area mean plus 3-sigma, where sigma is the standard deviation of the gamma readings in the reference or background area. Background activity for Ra-226 was determined to be 0.485 pCi/g, establishing the release limit at 1.485 pCi/g. The mean activity in the background reference area

was established at 0.001 pCi/g for Pu-239 and 0.020 pCi/g for U-235. The other ROCs were assumed to have a mean reference area activity of zero.

Appendix A begins on p. 28 of this document:

http://www.envirostor.dtsc.ca.gov/regulators/deliverable_documents/7709416031/Parcel%20G%20Radiological%20Removal%20Action%20Completion%20Report%20Part%203_Hunters%20Point_12.02.2011.pdf

Parcel D-1, p. 7-44

The investigation level for gamma radiation surveys was established at the reference area mean plus 3-sigma, where sigma is the standard deviation of the gamma readings in the reference or background area. Background activity for Ra-226 was determined to be 0.485 pCi/g, establishing the release limit at 1.485 pCi/g. The mean activity in the background reference area was established at 0.001 pCi/g for Pu-239 and 0.020 pCi/g for U-235. The other ROCs were assumed to have a mean reference area activity of zero.